

EXHIBIT 2

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

| | | | |
|---|----------------------------|------------------------|------------|
| Application Data Sheet 37 CFR 1.76 | | Attorney Docket Number | NETL.040C1 |
| | | Application Number | |
| Title of Invention | NON-VOLATILE MEMORY MODULE | | |
| <p>The application data sheet is part of the provisional or nonprovisional application for which it is being submitted. The following form contains the bibliographic data arranged in a format specified by the United States Patent and Trademark Office as outlined in 37 CFR 1.76.</p> <p>This document may be completed electronically and submitted to the Office in electronic format using the Electronic Filing System (EFS) or the document may be printed and included in a paper filed application.</p> | | | |

Secrecy Order 37 CFR 5.2

☐ Portions or all of the application associated with this Application Data Sheet may fall under a Secrecy Order pursuant to 37 CFR 5.2 (Paper filers only. Applications that fall under Secrecy Order may not be filed electronically.)

Applicant Information:

| | | | | | |
|---|------------------------|---|--------------------|--|----|
| Applicant 1 | | | | | |
| Applicant Authority | | <input checked="" type="radio"/> Inventor | | <input type="radio"/> Legal Representative under 35 U.S.C. 117 | |
| | | | | <input type="radio"/> Party of Interest under 35 U.S.C. 118 | |
| Prefix | Given Name | Middle Name | Family Name | Suffix | |
| | Chi-She | | Chen | | |
| Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service | | | | | |
| City | Walnut | State/Province | CA | Country of Residence | US |
| Citizenship under 37 CFR 1.41(b) | | TW | | | |
| Mailing Address of Applicant: | | | | | |
| Address 1 | 944 Crystal Water Lane | | | | |
| Address 2 | | | | | |
| City | Walnut | State/Province | CA | | |
| Postal Code | 91789 | Country | US | | |
| Applicant 2 | | | | | |
| Applicant Authority | | <input checked="" type="radio"/> Inventor | | <input type="radio"/> Legal Representative under 35 U.S.C. 117 | |
| | | | | <input type="radio"/> Party of Interest under 35 U.S.C. 118 | |
| Prefix | Given Name | Middle Name | Family Name | Suffix | |
| | Jeffrey | C. | Solomon | | |
| Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service | | | | | |
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| Citizenship under 37 CFR 1.41(b) | | US | | | |
| Mailing Address of Applicant: | | | | | |
| Address 1 | 6 Silver Fir | | | | |
| Address 2 | | | | | |
| City | Irvine | State/Province | CA | | |
| Postal Code | 92604 | Country | US | | |
| Applicant 3 | | | | | |
| Applicant Authority | | <input checked="" type="radio"/> Inventor | | <input type="radio"/> Legal Representative under 35 U.S.C. 117 | |
| | | | | <input type="radio"/> Party of Interest under 35 U.S.C. 118 | |
| Prefix | Given Name | Middle Name | Family Name | Suffix | |
| | Scott | H. | Milton | | |
| Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service | | | | | |
| City | Irvine | State/Province | CA | Country of Residence | US |

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| Title of Invention | NON-VOLATILE MEMORY MODULE | | |

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|--|-------------------|--|--------------------|
| Citizenship under 37 CFR 1.41(b) | | US | |
| Mailing Address of Applicant: | | | |
| Address 1 | | 49 Statehouse Place | |
| Address 2 | | | |
| City | Irvine | State/Province | CA |
| Postal Code | 92602 | Country | US |
| Applicant 4 | | | |
| Applicant Authority | | <input checked="" type="radio"/> Inventor <input type="radio"/> Legal Representative under 35 U.S.C. 117 <input type="radio"/> Party of Interest under 35 U.S.C. 118 | |
| Prefix | Given Name | Middle Name | Family Name |
| | Jayesh | | Bhakta |
| Residence Information (Select One) <input checked="" type="radio"/> US Residency <input type="radio"/> Non US Residency <input type="radio"/> Active US Military Service | | | |
| City | Cerritos | State/Province | CA |
| Country of Residence | | US | |
| Citizenship under 37 CFR 1.41(b) | | US | |
| Mailing Address of Applicant: | | | |
| Address 1 | | 12220 Rose Street | |
| Address 2 | | | |
| City | Cerritos | State/Province | CA |
| Postal Code | 90703 | Country | US |
| All Inventors Must Be Listed - Additional Inventor Information blocks may be generated within this form by selecting the Add button. Add | | | |

Correspondence Information:

| | |
|---|---|
| Enter either Customer Number or complete the Correspondence Information section below. For further information see 37 CFR 1.33(a). | |
| <input type="checkbox"/> An Address is being provided for the correspondence Information of this application. | |
| Customer Number | 20995 |
| Email Address | efiling@kmob.com Add Email Remove Email |

Application Information:

| | | | |
|--|----------------------------|---|---|
| Title of the Invention | NON-VOLATILE MEMORY MODULE | | |
| Attorney Docket Number | NETL.040C1 | Small Entity Status Claimed <input type="checkbox"/> | |
| Application Type | Nonprovisional | | |
| Subject Matter | Utility | | |
| Suggested Class (if any) | | Sub Class (if any) | |
| Suggested Technology Center (if any) | | | |
| Total Number of Drawing Sheets (if any) | 12 | Suggested Figure for Publication (if any) | 1 |

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Publication Information:

| | |
|-------------------------------------|---|
| <input type="checkbox"/> | Request Early Publication (Fee required at time of Request 37 CFR 1.219) |
| <input checked="" type="checkbox"/> | Request Not to Publish. I hereby request that the attached application not be published under 35 U.S.C. 122(b) and certify that the invention disclosed in the attached application has not and will not be the subject of an application filed in another country, or under a multilateral international agreement, that requires publication at eighteen months after filing. |

Representative Information:

| | | | |
|---|--|--|---|
| Representative information should be provided for all practitioners having a power of attorney in the application. Providing this information in the Application Data Sheet does not constitute a power of attorney in the application (see 37 CFR 1.32). Enter either Customer Number or complete the Representative Name section below. If both sections are completed the Customer Number will be used for the Representative Information during processing. | | | |
| Please Select One: | <input checked="" type="radio"/> Customer Number | <input type="radio"/> US Patent Practitioner | <input type="radio"/> Limited Recognition (37 CFR 11.9) |
| Customer Number | 20995 | | |

Domestic Benefit/National Stage Information:

| | | | |
|--|--------------------|--------------------------|--------------------------|
| This section allows for the applicant to either claim benefit under 35 U.S.C. 119(e), 120, 121, or 365(c) or indicate National Stage entry from a PCT application. Providing this information in the application data sheet constitutes the specific reference required by 35 U.S.C. 119(e) or 120, and 37 CFR 1.78(a)(2) or CFR 1.78(a)(4), and need not otherwise be made part of the specification. | | | |
| Prior Application Status | Pending | Remove | |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| | Continuation of | 12/131873 | 2008-06-02 |
| Prior Application Status | Expired | Remove | |
| Application Number | Continuity Type | Prior Application Number | Filing Date (YYYY-MM-DD) |
| 12/131873 | non provisional of | 60/941586 | 2007-06-01 |
| Additional Domestic Benefit/National Stage Data may be generated within this form by selecting the Add button. | | | |

Foreign Priority Information:

| | | | |
|---|----------------------|---------------------------------|---|
| This section allows for the applicant to claim benefit of foreign priority and to identify any prior foreign application for which priority is not claimed. Providing this information in the application data sheet constitutes the claim for priority as required by 35 U.S.C. 119(b) and 37 CFR 1.55(a). | | | |
| Remove | | | |
| Application Number | Country ¹ | Parent Filing Date (YYYY-MM-DD) | Priority Claimed |
| | | | <input type="radio"/> Yes <input checked="" type="radio"/> No |
| Additional Foreign Priority Data may be generated within this form by selecting the Add button. | | | |

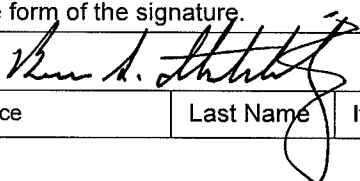
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| Application Data Sheet 37 CFR 1.76 | | Attorney Docket Number | NETL.040C1 |
| | | Application Number | |
| Title of Invention | NON-VOLATILE MEMORY MODULE | | |

Assignee Information:

| | | | |
|---|---------------|----------------|-------|
| Providing this information in the application data sheet does not substitute for compliance with any requirement of part 3 of Title 37 of the CFR to have an assignment recorded in the Office. | | | |
| Assignee 1 | | | |
| If the Assignee is an Organization check here. <input checked="" type="checkbox"/> | | | |
| Organization Name | Netlist, Inc. | | |
| Mailing Address Information: | | | |
| Address 1 | 51 Discovery | | |
| Address 2 | Suite 150 | | |
| City | Irvine | State/Province | CA |
| Country | US | Postal Code | 92618 |
| Phone Number | | Fax Number | |
| Email Address | | | |
| Additional Assignee Data may be generated within this form by selecting the Add button. | | | |

Signature:

| | | | | | |
|--|---|-----------|-------------------|---------------------|-------|
| A signature of the applicant or representative is required in accordance with 37 CFR 1.33 and 10.18. Please see 37 CFR 1.4(d) for the form of the signature. | | | | | |
| Signature |  | | Date (YYYY-MM-DD) | 2008-09-29 | |
| First Name | Bruce | Last Name | Itchkawitz | Registration Number | 47677 |

This collection of information is required by 37 CFR 1.76. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 23 minutes to complete, including gathering, preparing, and submitting the completed application data sheet form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
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Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------|------------------|
| 12/240,916 | 09/29/2008 | Chi-She Chen | 987-04-CON | 6240 |
| 22145 | 7590 | 03/31/2011 | EXAMINER | |
| KLEIN, O'NEILL & SINGH, LLP 18200 VON KARMAN AVENUE SUITE 725 IRVINE, CA 92612 | | | ROJAS, MIDYS | |
| | | | ART UNIT | PAPER NUMBER |
| | | | 2185 | |
| | | | MAIL DATE | DELIVERY MODE |
| | | | 03/31/2011 | PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

12/240,916

Applicant(s)

CHEN ET AL.

Examiner

MIDYS ROJAS

Art Unit

2185

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 29 September 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-54 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) _____ is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☒ Claim(s) 1-54 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2008 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

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Art Unit: 2185

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DETAILED ACTION

Election/Restrictions

Restriction to one of the following inventions is required under 35 U.S.C. 121:

- I. Claims 1-20, and 43-49, drawn to a non-volatile and a volatile memory systems, classified in class 711, subclass 100 and 104.
- II. Claims 21-36, drawn to a power module for a volatile and non-volatile memory including a voltage conversion element, classified in class 327, subclass 51; class 365, subclass 242; and class 714, subclass 721.
- III. Claims 37-42 drawn to non-volatile and a volatile memory systems wherein the memory systems operate at different frequencies depending on the mode of operation classified in class 715, subclass 745, 789, 811.
- IV. Claims 50-54, drawn to restoring data, classified in class 707 subclass 679, 680, 681.

The inventions are distinct, each from the other because of the following reasons:

Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination II has separate utility such as use in a system where a voltage conversion element is used for convert operational voltage in order to operation in different modes. See MPEP § 806.05(d).

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Inventions I and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination III has separate utility such as use in a system where different modes of operation represent different operational frequencies. See MPEP § 806.05(d).

Inventions I and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination IV has separate utility such as use in a system where data can be restored. See MPEP § 806.05(d).

Inventions II and III are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination III has separate utility such as use in a system where different modes of operation represent different operational frequencies. See MPEP § 806.05(d).

Inventions II and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination IV has separate utility such as use in a system where data can be restored. See MPEP § 806.05(d).

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Inventions III and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct if they do not overlap in scope and are not obvious variants, and if it is shown that at least one subcombination is separately usable. In the instant case, subcombination IV has separate utility such as use in a system where data can be restored. See MPEP § 806.05(d).

The examiner has required restriction between subcombinations usable together. Where applicant elects a subcombination and claims thereto are subsequently found allowable, any claim(s) depending from or otherwise requiring all the limitations of the allowable subcombination will be examined for patentability in accordance with 37 CFR 1.104. See MPEP § 821.04(a). Applicant is advised that if any claim presented in a continuation or divisional application is anticipated by, or includes all the limitations of, a claim that is allowable in the present application, such claim may be subject to provisional statutory and/or nonstatutory double patenting rejections over the claims of the instant application.

Restriction for examination purposes as indicated is proper because all these inventions listed in this action are independent or distinct for the reasons given above and there would be a serious search and/or examination burden if restriction were not required because at least the following reason(s) apply:

- (a) the inventions have acquired a separate status in the art in view of their different classification;
- (b) the inventions have acquired a separate status in the art due to their recognized divergent subject matter;

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(c) the inventions require a different field of search (for example, searching different classes/subclasses or electronic resources, or employing different search queries);

Applicant is advised that the reply to this requirement to be complete must include (i) an election of a invention to be examined even though the requirement may be traversed (37 CFR 1.143) and (ii) identification of the claims encompassing the elected invention.

The election of an invention may be made with or without traverse. To reserve a right to petition, the election must be made with traverse. If the reply does not distinctly and specifically point out supposed errors in the restriction requirement, the election shall be treated as an election without traverse. Traversal must be presented at the time of election in order to be considered timely. Failure to timely traverse the requirement will result in the loss of right to petition under 37 CFR 1.144. If claims are added after the election, applicant must indicate which of these claims are readable upon the elected invention.

Should applicant traverse on the ground that the inventions are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the inventions to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. 103(a) of the other invention.

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Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MIDYS ROJAS whose telephone number is (571)272-4207. The examiner can normally be reached on M-TH 6:00am - 4:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sanjiv Shah can be reached on (571) 272-4098. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Midys Rojas/
Examiner, Art Unit 2185

U.S. Patent Application No.: 12/240,916
Response to Restriction Requirement of March 31, 2011
Attorney Docket No.: 987-004.201

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicant(s): Chen et al.
Assignee: Netlist, Inc.
Title: **NON-VOLATILE MEMORY MODULE**
Serial No.: 12/240,916 Filed: September 29, 2008
Examiner: Rojas, Midys Group Art Unit: 2185
Attorney Docket No.: 987-004.201 Confirmation No.: 6240

Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

PRELIMINARY AMENDMENT
AND REPLY TO ELECTION/RESTRICTION REQUIREMENT

Sir:

In response to the restriction/election requirement mailed March 31, 2011, please amend the application as shown on the pages below.

Amendments to the Claims are described on page 2 of this paper.

Remarks begin on page 9 of this paper.

A Request for a One-Month Extension of Time under 37 CFR 1.136(a) is submitted herewith, along with the fee prescribed by 37 CFR 1.17(a)(1).

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Response to Restriction Requirement of March 31, 2011
Attorney Docket No.: 987-004.201

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Withdrawn) A memory system coupled to a computer system, comprising:
a volatile memory subsystem;
a non-volatile memory subsystem;
a controller operatively coupled to the non-volatile memory subsystem;
at least one circuit configured to selectively operatively decouple the controller from the volatile memory subsystem.
2. (Withdrawn) The memory system of Claim 1, wherein the memory system is configured to
be operated in at least two states, the at least two states comprising:
a first state in which the controller and the non-volatile memory subsystem are decoupled from the volatile memory subsystem by the at least one circuit; and
a second state in which the volatile memory subsystem is operatively coupled to the controller to allow data to be communicated between the volatile memory subsystem and the non-volatile memory subsystem via the controller.
3. (Withdrawn) The memory system of Claim 2, wherein power is supplied to the volatile memory subsystem from a first power supply when the memory system is in the first state and power is supplied to the volatile memory subsystem from a second power supply when the memory system is in the second state.
4. (Withdrawn) The memory system of Claim 3, wherein the second power supply does not comprise a battery.
5. (Withdrawn) The memory system of Claim 3, wherein the second power supply comprises one or more capacitors.
6. (Withdrawn) The memory system of Claim 5, wherein the second power supply comprises a battery and is configured to power the volatile memory subsystem for less

U.S. Patent Application No.: 12/240,916
Response to Restriction Requirement of March 31, 2011
Attorney Docket No.: 987-004.201

than thirty minutes.

7. (Withdrawn) The memory system of Claim 5, wherein the one or more capacitors comprises one or more double layered capacitors.

8. (Withdrawn) The memory system of Claim 5, wherein the one or more capacitors are charged by the first power supply while the memory system is in the first state.

9. (Withdrawn) The memory system of Claim 3, further comprising a printed circuit board, wherein the second power supply and the memory system are located on the printed circuit board.

10. (Withdrawn) The memory system of Claim 3, wherein the at least two states further comprise a third state in which power is supplied to the volatile memory subsystem from a third power supply.

11. (Withdrawn) The memory system of Claim 2, wherein the controller and the non-volatile memory subsystem do not add a significant capacitive load to the volatile memory system when the memory system is in the first state.

12. (Withdrawn) The memory system of Claim 1, wherein the volatile memory subsystem comprises one or more DRAM memory elements.

13. (Withdrawn) The memory system of Claim 1, wherein the volatile memory subsystem comprises one or more SRAM memory elements.

14. (Withdrawn) The memory system of Claim 1, wherein the non-volatile memory subsystem comprises one or more flash memory elements.

15. (Withdrawn) The memory system of Claim 1, wherein the memory system is implemented on a memory module.

16. (Withdrawn) The memory system of Claim 1, wherein the at least one circuit comprise one or more switches coupled to the controller, to the volatile memory subsystem, and to the host computer.

17. (Withdrawn) The memory system of Claim 1, wherein the volatile memory subsystem comprises a registered DIMM comprising one or more registers and a plurality of DRAM elements, wherein the one or more registers are coupled to the computer system.

18. (Withdrawn) The memory system of Claim 17, wherein the at least one circuit comprise one or more switches coupled to the one or more registers and to the plurality of DRAM elements and configured to selectively operatively couple the volatile memory subsystem and

U.S. Patent Application No.: 12/240,916
Response to Restriction Requirement of March 31, 2011
Attorney Docket No.: 987-004.201

to the computer system.

19. (Withdrawn) The memory system of Claim 17, wherein the one or more registers are coupled to the plurality of DRAM elements and the at least one circuit comprises one or more switches coupled to the one or more registers and to a power source for the one or more registers, wherein the one or more switches are configured to selectively operatively couple the one or more registers to the power source for the one or more registers.

20. (Withdrawn) The memory system of Claim 1, wherein the non-volatile memory subsystem comprises at least 100 percent more storage capacity than does the volatile memory subsystem.

21. (Withdrawn) A power module for providing a plurality of voltages to a memory system comprising non-volatile and volatile memory, the plurality of voltages comprising at least a first voltage and a second voltage, the power module comprising:

- an input providing a third voltage to the power module;

- a voltage conversion element configured to provide the second voltage to the memory system;

- a first power element configured to selectively provide a fourth voltage to the conversion element;

- a second power element configured to selectively provide a fifth voltage to the conversion element, wherein the power module is configured to selectively provide the first voltage to the memory system either from the conversion element or from the input, wherein the power module is configured to be operated in at least three states comprising:

- a first state in which the first voltage is provided to the memory system from the input and the fourth voltage is provided to the conversion element from the first power element;

- a second state in which the fourth voltage is provided to the conversion element from the first power element and the first voltage is provided to the memory system from the conversion element;

- a third state in which the fifth voltage is provided to the conversion element from the second power element and the first voltage is provided to the memory system from the conversion element.

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22. (Withdrawn) The power module of Claim 21, wherein the first power element comprises a pulse-width modulation power controller.

23. (Withdrawn) The power module of Claim 21, wherein the second power element does not comprise a battery.

24. (Withdrawn) The power module of Claim 21, wherein the second power element comprises one or more capacitors.

25. (Withdrawn) The power module of Claim 24, wherein the second power element comprises a battery and is configured to power the volatile memory for less than thirty minutes.

26. (Withdrawn) The power module of Claim 21, wherein the conversion element comprises one or more buck converters.

27. (Withdrawn) The power module of Claim 21, wherein the conversion element comprises one or more buck-boost converters.

28. (Withdrawn) A method of providing a first voltage and a second voltage to a memory system including volatile and non-volatile memory subsystems, the method comprising:

 during a first condition, providing the first voltage to the memory system from an input power supply and providing the second voltage to the memory system from a first power subsystem;

 detecting a second condition;

 during the second condition, providing the first voltage and the second voltage to the memory system from the first power subsystem;

 charging a second power subsystem;

 detecting a third condition;

 during the third condition, providing the first voltage and the second voltage to the memory system from the second power subsystem.

29. (Withdrawn) The method of Claim 28, wherein detecting the second condition comprises detecting that a trigger condition is likely to occur.

30. (Withdrawn) The method of Claim 29, wherein detecting the third condition comprises detecting that the trigger condition has occurred.

31. (Withdrawn) The method of Claim 28, wherein the trigger condition comprises a power reduction.

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32. (Withdrawn) The method of Claim 28, wherein the trigger condition comprises a power failure.

33. (Withdrawn) The method of Claim 28, wherein the trigger condition comprises a system hang-up.

34. (Withdrawn) The method of Claim 28, wherein the first power subsystem comprises a pulse-width modulation power controller and a voltage conversion subsystem.

35. (Withdrawn) The method of Claim 28, wherein the second power subsystem does not comprise a battery.

36. (Withdrawn) The method of Claim 35, wherein the second power subsystem comprises one or more capacitors and the voltage conversion subsystem.

37. (Original) A method of controlling a memory system operatively coupled to a host system and which includes a volatile memory subsystem and a non-volatile memory subsystem, the method comprising:

operating the volatile memory subsystem at a first frequency when the memory system is in a first mode of operation in which data is communicated between the volatile memory subsystem and the host system;

operating the non-volatile memory subsystem at a second frequency when the memory system is in a second mode of operation in which data is communicated between the volatile memory subsystem and the non-volatile memory subsystem; and

operating the volatile memory subsystem at a third frequency when the memory system is in the second mode of operation, the third frequency less than the first frequency.

38. (Original) The method of Claim 37, wherein the third frequency is approximately equal to the second frequency.

39. (Original) The method of Claim 37, wherein the memory system is not powered by a battery when it is in the second mode of operation.

40. (Currently Amended) The method of Claim ~~[[7]]~~ 37, wherein the memory system switches from the first mode of operation to the second mode of operation in response to a trigger condition.

41. (Original) The method of Claim 40, wherein the trigger condition comprises a power failure condition.

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42. (Original) The method of Claim 37, wherein the memory system further comprises a printed circuit board and the volatile memory subsystem and the non-volatile memory subsystem are located on the printed circuit board.

43. (Withdrawn) A method of controlling a memory system operatively coupled to a host system and which includes a volatile memory subsystem and a non-volatile memory subsystem, the method comprising:

communicating data words between the volatile memory subsystem and the host system when the memory system is in a first mode of operation; and

transferring data words from the volatile memory subsystem to the nonvolatile memory subsystem when the memory system is in a second mode of operation, wherein transferring each data word comprises:

storing a first portion of the data word in a buffer;

storing a second portion of the data word in the buffer;

and writing the entire data word from the buffer to the non-volatile memory subsystem.

44. (Withdrawn) The method of Claim 43, wherein the transferring each data word further comprises storing a third portion of each data word in the buffer.

45. (Withdrawn) A memory system operatively coupled to a host system, comprising:

a volatile memory subsystem;

a non-volatile memory subsystem comprising at least 100 percent more storage capacity than does the volatile memory subsystem; and

a controller operatively coupled to the volatile memory subsystem and operatively coupled to the non-volatile memory subsystem, the controller configured to allow data to be communicated between the volatile memory subsystem and the host system when the memory system is operating in a first state and to allow data to be communicated between the volatile memory subsystem and the non-volatile memory subsystem when the memory system is opeiating in a second state.

46. (Withdrawn) The memory system of Claim 45, wherein power is supplied to the volatile memory subsystem from a first power supply when the memory system is in the first state.

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47. (Withdrawn) The memory system of Claim 46, wherein power is supplied to the volatile memory subsystem from a second power supply when the memory system is in the second state.

48. (Withdrawn) The memory system of Claim 47, wherein the second power supply does not comprise a battery.

49. (Withdrawn) The memory system of Claim 45, wherein the memory system further comprises a printed circuit board and the volatile memory subsystem, the non-volatile memory subsystem, and the controller are located on the printed circuit board.

50. (Withdrawn) A method of controlling a memory system operatively coupled to a host system and which includes a volatile memory subsystem and a non-volatile memory subsystem, the method comprising:

communicating data between the volatile memory subsystem and the host system when the memory system is in a first mode of operation;

storing a first copy of data from the volatile memory subsystem to the nonvolatile memory subsystem at a first time when the memory system is in a second mode of operation;

restoring the first copy of data from the non-volatile memory subsystem to the volatile memory subsystem;

erasing the first copy of data from the non-volatile memory subsystem; and

storing a second copy of data from the volatile memory subsystem to the non-volatile memory subsystem at a second time when the memory system is in the second mode of operation, wherein storing the second copy begins before the first copy is completely erased from the non-volatile memory subsystem.

51. (Withdrawn) The method of Claim 50, further comprising restoring the second copy of data from the non-volatile memory subsystem to the volatile memory subsystem.

52. (Withdrawn) The method of Claim 50, wherein the memory system enters the second mode of operation in response to a power failure.

53. (Withdrawn) The method of Claim 50, wherein the memory system is not powered by a battery when it is in the second mode of operation.

54. (Withdrawn) The method of Claim 50, wherein the first copy of data and the second copy of data are stored in separate portions of the non-volatile memory subsystem.

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REMARKS

In response to the restriction/election requirement mailed March 31, 2011, applicant elects to prosecute Group III. At least the following claims read on the elected group: Claims 37-42.

This election is made without traverse.

A Request for a One Month Extension of Time under 37 CFR 1.136(a) is submitted herewith, along with the fee prescribed by 37 CFR 1.17(a)(1).

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact the undersigned.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 11-1159 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,



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